Trend Study 28-4-03

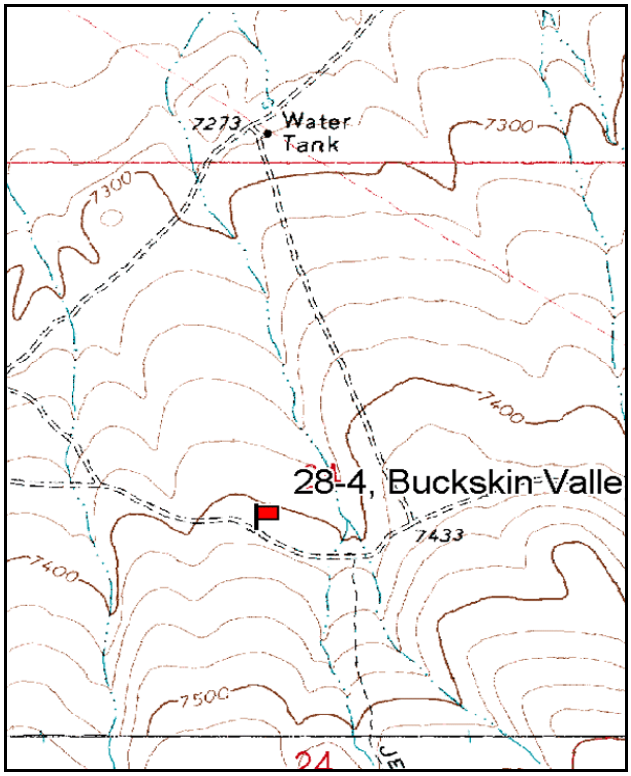
Study site name: Buckskin Valley . Vegetation type: Mixed Mountain Brush .

Compass bearing: frequency baseline 182 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft). Rebar: belt 4 on 10ft.

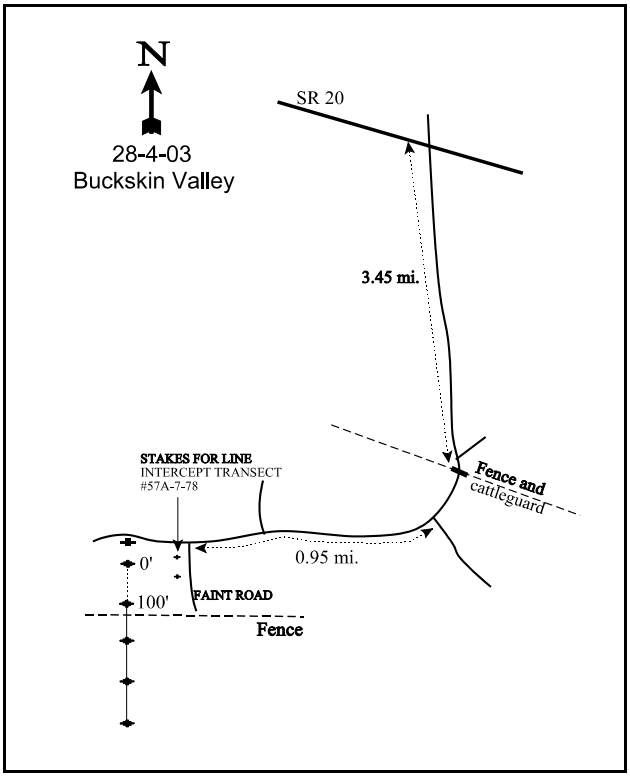
LOCATION DESCRIPTION

From SR 20 just west of mile marker 7, turn south onto the Buckskin Valley road. Travel 3.45 miles to a cattleguard. Just beyond the fence and cattleguard, bear right and proceed west 0.95 miles to an intersection where a very faint road goes to the south. About 60 feet west of this intersection is the witness post on the south (left) side of the road. The 0-foot stake is 6 feet southeast of the witness post. The 0-foot stake is a 2 foot tall green fencepost marked by a red browse tag #9005. The frequency baseline runs south-southwest from here. The old line-intercept transect 57A-7-78 is marked by a red-painted steel fencepost 10 feet east of this study.



Map Name: Burnt Peak

Township 32S , Range 7W , Section 24



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4207348 N, 359509 E

DISCUSSION

Buckskin Valley - Trend Study No. 28-4

Buckskin Valley, located on the northern end of the unit, is important big game transitional range. This study samples a mountain big sagebrush dominated community at an elevation of 7,400 feet. The study site slopes gently (5%) to the northeast. The lower areas have been extensively treated by the BLM to enhance livestock grazing. The area where the transect is located, in the upper part of the valley, is a cattle-sheep allotment used for late spring grazing, although cattle were on the site during the 1992 reading in early August. A pellet group transect read on the study site in 1998 estimated 49 deer days use/acre (121 ddu/ha) and 7 cow days use/acre (17 cdu/ha). Pellet group transect data collected in 2003 estimated 51 deer, 1 cow, and 12 sheep days use/acre (126 ddu/ha, 2 cdu/ha, and 30 sdu/ha). Sheep had grazed the site in 2003 prior to sampling, while deer use appeared to be from the winter.

Soil analysis indicates a loam texture with a moderately acidic pH (5.9). The effective rooting depth was estimated at just over 14 inches. The soil is dark in color and rocks are fairly common on the surface. There is evidence of compaction and crusting due to the relatively high clay content (26%). However, erosion is minimal and soils were given a stable rating in 2003 from an erosion condition class assessment. Vegetation and litter cover are abundant and effectively protect the soil surface from erosion. Bare ground was moderate in 2003 at 18%.

A dense stand of mountain big sagebrush dominates the study site. Population density was estimated at 5,160 plants/acre in 1998 and 4,620 plants/acre in 2003. Canopy cover of mountain big sagebrush was estimated at nearly 35% in 2003. The population is overly mature with moderate to high decadence in all years. Percent decadence has ranged from 26%-56%, with decadent plants making up 44% of the population in 2003. About 1/4 of the decadent age class in 1998 and 2003 was classified as dying. The proportion of the population made up of seedling and young plants has been low in all readings. Utilization of sagebrush was moderate to heavy in 1987 and 1992, moderate in 1998, and mostly light in 2003. Sagebrush vigor has been normal on the majority of the population in all years. Sagebrush leaders had averaged 1.5 inches of annual growth when the site was read in late June of 2003. This site would be a good candidate for mechanical treatment to thin out the sagebrush population in favor of bitterbrush and the herbaceous understory.

Interspersed in the dense sagebrush canopy are highly preferred bitterbrush plants. Bitterbrush density was estimated at just under 2,000 plants/acre in 1998 and 2003, and canopy cover was estimated at 7% in 2003. Young plants were very abundant in 1987 and 1992 as they made up 50% and 34% of the population respectively. The proportion of young in the population has steadily declined since 1992 at 15% in 1998 and 3% in 2003. Utilization has been moderate to heavy in all readings, while vigor has been mostly normal. Moderate to heavy use on bitterbrush occurs as a result of use by big game and sheep. Bitterbrush leaders averaged 2 inches of annual growth when the site was read in late June of 2003. Other browse species that occur in low densities include Gambel oak, snowberry, and prickly pear cactus.

Sheltered by the dense shrub overstory is a variety of fairly abundant herbaceous species. Western wheatgrass, bottlebrush squirreltail, Letterman needlegrass, mutton bluegrass, and Kentucky bluegrass are the predominant perennial grasses. Cheatgrass is also fairly abundant and was sampled in over half of the quadrats in 1998 and 2003, a significant increase since 1992. Cheatgrass does not pose a serious fire hazard yet, but with further increases it could. Perennial grass sum of nested frequency has declined with each reading since 1992. Forbs had high diversity and abundance on this site from 1987-1998, but showed a moderate decline in sum of nested frequency and average cover in 2003 with drought. Prior to 2003, the most abundant perennial forbs included timber milkvetch, douglas chaenactis, thistle, redroot eriogonum, silvery lupine, longleaf phlox, clover, and foothill deathcamas. A lot of these species had lower nested frequency values in 2003 compared to 1998. The annual, littleflower collinsia, was very abundant in 1998 and 2003.

This species accounted for 69% of the total forb cover in 2003. As with grasses, sum of nested frequency of perennial forbs declined in 2003.

1987 APPARENT TREND ASSESSMENT

Soil is well protected from erosion on this site with litter providing an estimated 75% ground cover. Overstory and basal vegetative cover is also good, leaving only 9% bare soil exposed. The soil trend appears stable. The sagebrush population is overly mature with little reproductive potential and a high proportion of decadent plants. Bitterbrush has a younger population with good biotic and reproductive potentials. However, 73% of the bitterbrush encountered displayed heavy use. Trend for these key browse species appears stable for the time being. Herbaceous plants are diverse and fairly abundant.

1992 TREND ASSESSMENT

The soil trend appears stable with abundant litter and vegetation cover with 15% bare ground. Browse trend is down for sagebrush due to low biotic and reproductive potentials and increased heavy use and decadence. Decadence increased from 36% to 56% in 1992. Sagebrush makes up 72% of the total browse cover. Trend for bitterbrush is slightly up, but it is still being heavily utilized and it only makes up 17% of the browse cover. Overall, the browse trend is slightly down. The herbaceous understory is diverse and abundant. Grasses account for 18% of the total vegetative cover while forbs make up 13%. Perennial herbaceous understory sum of nested frequency slightly increased indicating a slightly upward trend.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - slightly upward (4)

1998 TREND ASSESSMENT

The soil trend is slightly upward with an increase in the proportion of protective ground cover. Although percent bare ground increased slightly, there is adequate vegetative and litter cover to protect against erosion. Ideally, percent browse cover would be lower and more of the cover would be contributed by the herbaceous understory. While browse dominates the site, herbaceous cover will remain low as the grasses and forbs are shaded out. The browse trend is slightly downward. The mountain big sagebrush population will continue to decline as long as the biotic potential stays low. The mountain big sagebrush population has a lower rate of decadence then in 1992, but the percentage of decadent plants classified as dying has increased. A slight thinning of the mountain big sagebrush population would not be detrimental and would greatly benefit the herbaceous understory. The antelope bitterbrush population is healthy with good biotic potential and many young plants encountered. The herbaceous understory trend is downward with a decrease in perennial herbaceous understory sum of nested frequency from 919 in 1992 to 705 in 1998. Cheatgrass has significantly increased in nested frequency since 1992 and could easily dominate the understory in a matter of years. If this happens, the site is at risk of being lost due to a wildfire.

TREND ASSESSMENT
soil - slightly upward (4)
browse - slightly downward (2)
herbaceous understory - down (1)

2003 TREND ASSESSMENT

Trend for soil is stable. Protective cover from vegetation and litter is high, even with a slight increase in bare ground. Erosion remains minimal. Trend for browse is slightly down. Mountain big sagebrush density decreased, percent decadence increased from 26% to 44%, and recruitment declined to only 1% of the population. In addition, about 1/4 of the decadent sagebrush sampled were classified as dying. The health of the mountain big sagebrush population is suffering from both drought and high intraspecific competition, as sagebrush canopy cover was estimated at nearly 35%, and population density numbers almost 5,000 plants/acre. The sagebrush population could use a period of self-thinning which appears to be happening at the present time. The bitterbrush population showed lower recruitment and higher decadence in 2003, but total density was stable at just under 1,900 plants/acre. Use on bitterbrush is mostly heavy, but vigor remains good. The stability of the bitterbrush population helps moderate the downward trends for sagebrush. Trend for the herbaceous understory is down. Both perennial grasses and forbs have decreased sum of nested frequency values since 1998. Drought and an overly abundant mountain big sagebrush population are having a detrimental effect on the herbaceous component. This site needs to be considered for treatment. As mountain big sagebrush and bitterbrush are typically fire intolerant, prescribed fire is probably not the best alternative. Mountain big sagebrush and bitterbrush are important on this site as forage during mild winters. However, the mountain big sagebrush population needs to be lowered to allow the herbaceous species to reverse their declines since 1992. The best alternative would be mechanical treatment to decrease the sagebrush population in favor of bitterbrush and the herbaceous understory.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Management unit 28 , Study no: 4

Type	Species	Nested Frequency				Average Cover %		
		'87	'92	'98	'03	'92	'98	'03
G	Agropyron cristatum	-	-	6	-	-	.06	-
G	Agropyron smithii	$_{b}$173	$_{ab}$185	$_{a}$136	103	4.03	1.58	.94
G	Agropyron spicatum	-	-	2	3	-	.00	.03
G	Bromus ciliatus	-	2	-	-	.01	-	-
G	Bromus tectorum (a)	-	$_{a}$42	$_{c}$167	$_{b}$143	.11	2.90	1.62
G	Poa fendleriana	$_{b}$37	$_{b}$47	$_{ab}$33	$_{a}$13	1.52	.95	.40
G	Poa pratensis	$_{a}$-	$_{a}$-	$_{c}$44	$_{b}$14	-	2.20	.28
G	Poa secunda	-	3	2	-	.01	.01	-
G	Sitanion hystrix	$_{b}$119	$_{b}$115	$_{a}$89	$_{a}$64	2.17	1.43	.78
G	Stipa comata	$_{a}$5	$_{b}$31	$_{a}$2	$_{a}$3	.18	.01	.03
G	Stipa lettermani	$_{a}$-	$_{b}$28	$_{b}$33	$_{a}$6	.51	.22	.18
Total for Annual Grasses		0	42	167	143	0.10	2.90	1.62
Total for Perennial Grasses		334	411	347	206	8.46	6.47	2.66
Total for Grasses		334	453	514	349	8.57	9.37	4.29

Type	Species	Nested Frequency				Average Cover %		
		'87	'92	'98	'03	'92	'98	'03
F	Agoseris glauca	-	-	4	6	-	.04	.07
F	Allium spp.	-	3	1	-	.00	.00	-
F	Arabis holboellii	$_{b}$44	$_{b}$27	$_{a}$2	$_{a}$-	.06	.01	-
F	Astragalus convallarius	1	8	5	10	.67	.06	.12
F	Astragalus panguicensis	$_{ab}$6	$_{bc}$9	$_{c}$27	$_{a}$-	.03	.36	-
F	Astragalus spp.	$_{b}$15	$_{b}$16	$_{a}$1	$_{a}$-	.07	.09	-
F	Balsamorhiza sagittata	-	-	2	-	-	.00	-
F	Calochortus nuttallii	2	-	5	4	-	.01	.01
F	Chaenactis douglasii	$_{c}$84	$_{c}$32	$_{b}$12	$_{a}$-	.17	.02	-
F	Cirsium wheeleri	$_{c}$35	$_{bc}$24	$_{ab}$16	$_{a}$1	.38	.41	.01
F	Cordylanthus kingii (a)	-	-	-	4	-	-	.03
F	Comandra pallida	5	7	6	12	.03	.03	.07
F	Collinsia parviflora (a)	-	$_{a}$115	$_{b}$262	$_{c}$330	.55	2.22	9.04
F	Crepis acuminata	-	9	6	5	.04	.05	.07
F	Cryptantha spp.	-	-	-	1	-	-	.00
F	Erigeron eatonii	$_{b}$11	$_{a}$-	$_{a}$-	$_{ab}$1	-	-	.00
F	Erigeron spp.	-	-	2	-	-	.00	-
F	Eriogonum racemosum	$_{b}$41	$_{b}$32	$_{ab}$24	$_{a}$8	.28	.14	.05
F	Eriogonum umbellatum	19	18	8	3	.07	.09	.01
F	Gayophytum ramosissimum(a)	-	-	-	7	-	-	.01
F	Ipomopsis aggregata	2	-	-	-	-	-	-
F	Lappula occidentalis (a)	-	-	-	2	-	-	.00
F	Linum lewisii	-	-	2	-	-	.03	-
F	Lithospermum spp.	-	-	3	-	-	.03	-
F	Lomatium spp.	$_{a}$-	$_{b}$9	$_{a}$-	$_{a}$-	.03	-	.00
F	Lupinus argenteus	31	45	55	35	1.42	3.22	1.65
F	Machaeranthera canescens	$_{b}$36	$_{a}$4	$_{a}$2	$_{a}$-	.04	.00	-
F	Microsteris gracilis (a)	-	$_{b}$112	$_{a}$61	$_{b}$138	.44	.26	1.08
F	Navarretia intertexta (a)	-	-	-	2	-	-	.03
F	Penstemon spp.	-	-	-	2	-	-	.03
F	Phlox longifolia	$_{b}$118	$_{c}$177	$_{b}$115	$_{a}$53	1.02	.97	.24
F	Polygonum douglasii (a)	-	-	4	-	-	.04	-
F	Senecio douglasii	4	-	-	-	-	-	-
F	Senecio multilobatus	$_{b}$18	$_{a}$1	$_{a}$1	$_{a}$-	.00	.00	-
F	Sphaeralcea coccinea	8	4	4	3	.01	.01	.00
F	Taraxacum officinale	6	1	-	-	.03	-	-

Type	Species	Nested Frequency				Average Cover %		
		'87	'92	'98	'03	'92	'98	'03
F	Tragopogon dubius	8	2	7	-	.00	.04	-
F	Trifolium spp.	$_{a}$16	$_{b}$42	$_{b}$43	$_{ab}$30	.15	.31	.11
F	Zigadenus paniculatus	$_{a}$7	$_{b}$38	$_{a}$5	$_{b}$37	.82	.04	.37
Total for Annual Forbs		0	227	327	483	0.99	2.53	10.21
Total for Perennial Forbs		517	508	358	211	5.38	6.02	2.86
Total for Forbs		517	735	685	694	6.37	8.55	13.08

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 28 , Study no: 4

Type	Species	Strip Frequency			Average Cover %		
		'92	'98	'03	'92	'98	'03
B	Artemisia tridentata vaseyana	98	94	92	24.29	24.87	27.41
B	Chrysothamnus depressus	1	0	0	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	2	0	0	-	-	-
B	Juniperus scopulorum	1	1	1	-	.03	.53
B	Mahonia repens	0	0	1	-	-	.03
B	Opuntia spp.	44	28	24	1.29	1.03	.57
B	Purshia tridentata	79	65	61	5.57	8.25	6.44
B	Quercus gambelii	2	3	6	1.62	.56	.41
B	Symphoricarpos oreophilus	17	17	18	.77	3.24	1.67
Total for Browse		244	208	203	33.56	38.00	37.07

CANOPY COVER, LINE INTERCEPT --
Management unit 28 , Study no: 4

Species	Percent Cover '03
Artemisia tridentata vaseyana	34.73
Juniperus scopulorum	.70
Opuntia spp.	.33
Purshia tridentata	6.55
Quercus gambelii	1.00
Symphoricarpos oreophilus	1.61

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 28 , Study no: 4

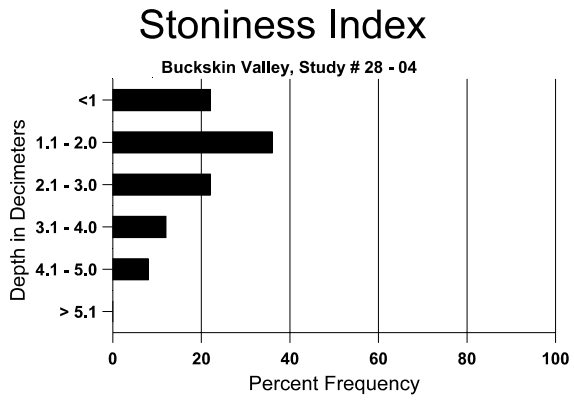
Species	Average leader growth (in) '03
Artemisia tridentata vaseyana	1.5
Purshia tridentata	2.0

BASIC COVER --
Management unit 28 , Study no: 4

Cover Type	Average Cover % '87	'92	'98	'03
Vegetation	7.50	42.98	50.00	48.48
Rock	5.50	5.53	4.95	3.54
Pavement	1.00	1.26	1.68	.55
Litter	74.50	59.12	66.59	53.09
Cryptogams	2.25	1.64	.98	.21
Bare Ground	9.25	14.50	16.27	18.33

SOIL ANALYSIS DATA --
Management unit 28, Study no: 4, Study Name: Buckskin Valley

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
14.3	50.4 (15.7)	5.9	44.2	30.0	25.8	3.8	22.7	236.8	0.4



PELLET GROUP DATA --
Management unit 28 , Study no: 4

Type	Quadrat Frequency		
	'92	'98	'03
Sheep	-	1	6
Rabbit	44	22	37
Elk	-	1	-
Deer	28	37	20
Cattle	-	2	1

Days use per acre (ha)	
'98	'03
-	12 (30)
-	-
-	-
49 (121)	51 (126)
7 (17)	1 (2)

BROWSE CHARACTERISTICS --
Management unit 28 , Study no: 4

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana											
87	**8732**	66	933	4666	3133	-	53	20	36	7	26/28
92	**8980**	160	300	3660	5020	-	49	32	56	16	-/-
98	**5160**	200	200	3640	1320	1160	40	5	26	8	29/37
03	**4620**	-	40	2560	2020	1360	10	3	44	13	35/37
Cercocarpus ledifolius											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	20	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Chrysothamnus depressus											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**20**	-	-	20	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	8/28
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**40**	-	40	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Juniperus scopulorum											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**20**	-	20	-	-	-	100	0	-	0	-/-
98	**20**	-	-	20	-	-	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	0	-/-

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Mahonia repens											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	0	3/4
Opuntia spp.											
87	**1132**	200	466	666	-	-	18	0	0	53	3/4
92	**2140**	100	820	1120	200	-	0	2	9	20	-/-
98	**740**	-	120	560	60	-	0	3	8	5	6/13
03	**840**	-	40	660	140	-	0	2	17	5	7/14
Purshia tridentata											
87	**1732**	866	866	866	-	-	19	73	0	0	22/31
92	**3080**	140	1060	1700	320	-	34	53	10	3	-/-
98	**1900**	180	280	1560	60	40	36	47	3	2	22/35
03	**1860**	-	60	1360	440	60	13	72	24	3	22/35
Quercus gambelii											
87	**133**	66	133	-	-	-	50	0	0	0	-/-
92	**460**	120	100	320	40	-	43	0	9	9	-/-
98	**400**	20	40	360	-	-	0	0	0	0	75/39
03	**380**	-	180	-	200	40	0	0	53	0	58/32
Symphoricarpos oreophilus											
87	**599**	-	466	133	-	-	22	0	0	0	20/19
92	**700**	100	200	480	20	-	57	11	3	9	-/-
98	**720**	-	120	600	-	-	33	0	0	0	14/25
03	**980**	-	20	960	-	-	6	29	0	0	11/18